RTTY

NEWS OF AMATEUR RADIO TELETYPE

PRICE — 15c

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Electronic Distributor for Transmitting

By ED PHILLIPS—W6IZJ

The following material is a description of an all-electronic sending distributor for use with the W. U. 1-A Tape Head. It includes both timing and tape advance functions, and has as an output a single pole double throw keying relay which may be used to key a tone oscillator, as is common in our two meter terminal units, or to key a frequency shift exciter for low frequency operation.

A mechanical distributor is simpler and more reliable in general than an electronic one but the construction requires machine shop facilities which are beyond the reach of many experimenters. Units could be built with simple hand tools, but the performance would probably leave much to be desired, particularly with regard to reliability and life.

The unit to be described here can be built with a soldering iron and usual hand tools, plus some sort of oscilloscope. The adjustments are few and simple, and the performance is adequate. The sending speed is about ten percent slower than the maximum possible with 60 wpm printers, but this can be corrected is desired.

The circuit as described is complete and suitable for amateur use. However, some of the parts used are not easy to obtain, and substitution may be necessary. For this reason, the description is intended to be more one of the general technique than of the particular circuitry employed. The reader may wish to modify the unit to fit in with existing equipment, or fufill particular requirements. It is hoped that the information given will be sufficient to make this possible.

A brief description of the operation of the 1-A with a conventional distributor will be given before describing the electronic unit in detail since the operations performed are the same in each case and the operation of the mechanical unit is easier to visualize. Figure 1A is a diagram of the mechanical distributor and associated circuitry which is used when operating with a keying relay. In this case, the relay is energized to produce a marking signal. The brush B rotates in a clockwise direction as a speed of approximately 368 rpm when a signal is being transmitted, and

(Continued on page 2)

FLASH—IN THE JULY ISSUE!
Electronic Keyboard, By W6IZJ
"On the Air Since 24 May, 1953"

HORSE TRADES

This page of the Bulletin is for use of amateurs who have teletype equipment for sale or trade and for those looking for equipment to buy or trade. It is a free service and may be the means of getting some one on the air.

FOR SALE: Model 12 complete, WU 1-A Tape Transmitter, also WU Tape Cutter w/line counter. Will include TU is requested. Also 2. 21-A printers W6RL
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Trade 12 TT w/keyb'd and Keyer for 15 Printer W6HFK
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SWAP—MG Set for Model 12 and WU Perforator For a Complete Tape Transmitter VE2ANM
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ELECTRONIC TRANSMITTING DISTRIBUTOR

(Continued from page 1)

rests on the stop contact when the tape is stopped. The width of each contact is chosen such that the brush rests on the stop contact for 31 milliseconds, and on each of the other contacts for 22 milliseconds. The contacts numbered 1 to 5 are wired to the corresponding contacts in the tape sensing unit, and a circuit is closed from the distributor contact to the keying relay whenever a hole in the tape appears under the appropriate contact. The stop contact is wired directly to the keying relay. An additional contact on the distributor operates the magnet which advances the tape, and is closed once each revolution of the distributor.

The sequence of operations is illustrated in Figure 1B, which shows the waveform and timing of the various signals in the circuit. The first five lines show the relative timing of the signals at each of the distributor contacts with respect to the beginning of the start interval, while the last line shows the current which would be supplied to the keying relay in order to send the letter "Y." In this case there would be holes in the tape in positions 1, 3, and 5. The operation of sending a letter signal starts when the brush moves from the stop contact to the start contact, opening the keying relay and producing a space signal during the 22 ms spent passing over the start contact. The brush now reaches contact No. 1 and since there is a hole in the tape at this point the circuit is closed to the relay and it is energized to send a mark signal in the No. 1 position. In a similar manner, no current is applied to the relay in position No. 2 and a space signal is sent. In this way the complete signal is built up and transmitted. When the brush returns to the stop (print) position, the auxiliary contacts close and energize the tape advance magnet, and the tape is moved into position for the next letter. Instead of being considered as a switch, the distributor and battery may be thought of as a pulse generator which produces impulses of the proper length and in the proper time sequence on each of the leads coming from the contacts. This is exactly the operation performed by the electronic unit to be described next.

Figure 2 is a block diagram of the unit. The important parts are a timing oscillator which produces pulses spaced 22 ms (corresponding to the basic signal unit length), a ring counter and diode switching network, and a DC amplifier which operates the keying relay. An additional circuit is provided to operate the advance magnet at the beginning of each stop period. The ring counter produces pulses at the cathodes of diodes No. 1 through No. 5 which correspond exactly to those produced by the mechanical distributor, and shown in lines 1 to 5 in Figure 1B. These are applied through the tape sensing contacts to the grid of an amplifier tube, which in turn energizes the keying relay. The diodes are used to prevent coupling of signals between the various cathodes when they are connected to the common contact of the tape head. The stop tube produces a pulse similar to that produced by the stop contact of the distributor, but is 44 ms long instead of 31. This is the only difference in the timing sequence of the electronic distributor and will be explained in more detail in the next section. This stop pulse is also coupled through a diode directly to the grid of the relay amplifier. At the beginning of each stop pulse the thyratron tube is triggered and discharges a condenser into the tape advance magnet, moving the tape ahead. The waveforms shown in Figure 1B apply to the electronic distributor if the stop interval is lengthened to 44 ms.

The timing oscillator runs at a frequency of 45 cycles, and is synchronized from the 60 cycle power line. The required frequency ratio of three to four is obtained by first multiplying the 60 cycles to 180 cycles and then dividing by four with a blocking oscillator, which produces the required 45 cycle pulses directly.

This completes the description of the block diagram. Before the actual circuit schematic is discussed the operation of the ring counter and the timing oscillator will be discussed in greater detail, since they form the heart of the unit.

Figure 3A is a schematic diagram of a portion of the ring counter channel and shows tube No. 5, the stop tube, and the start tube. The table in the figure shows the voltages at various points in the circuit before, during and after conduction of the stop tube.

The gas counter tubes used are three electrode cold cathode neon tubes; the third electrode is a starter anode which serves the same purpose as the grid in an ordinary thyratron or vacuum tube. With 130 volts between the anode and cathode, and with the starter anode tied to ground, the tube will not fire. If the voltage on the starter anode is raised to about 65 volts, a glow will start between it and the cathode, initiating a discharge between the anode and the cathode. At this point the voltage between the anode and cathode drops to about 70 volts (assuming a suitable series plate resistor) and is substantially independent of the cathode current. The discharge will continue until the anode to cathode voltage is dropped below about 50 volts for a period of about one millisecond, in which case it will cease to conduct current.

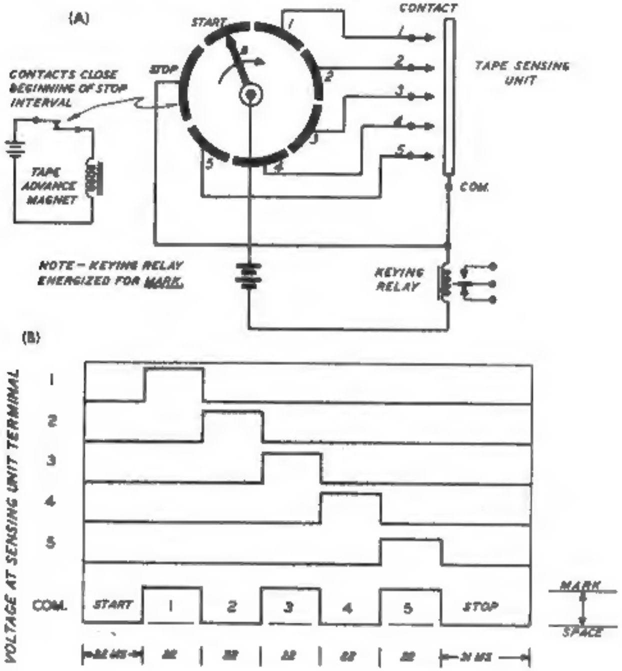
The operation of the counter is explained with the aid of Figure 3B. Assume that none of the tubes are conducting current, and that the plate voltage is held at 130 volts by some manner. 45 cycle pulses of approximately 20 volts amplitude are applied to each starter anode through the 1000 mmf coupling condensers. Since a minimum voltage of 65 between starter anode and cathode is needed to fire the tube, none of the tubes will conduct. Assume that tube No. 5 is then fired by a suitable means. The voltage on the starter anode of the stop tube will rise to the same voltage as the cathode of tube No. 5, or approximately 60 volts as the 1000 mmf grid condenser is charged through the resistor connecting it to the cathode of the No. 5 tube. The next pulse which is applied to the starter anode line will cause the stop tube to fire. Since the voltage drop is only 70 volts, and since the cathode condenser is uncharged, the voltage at the plate will drop from 130 volts to 70 volts. At the same time, since the condenser in the cathode of tube No. 5 is charged to plus 60 volts, the voltage between plate and cathode of tube No. 5 drops to 10 volts. As current continues to flow into the cathode circuit of the stop tube the condenser will become charged, and the voltage at the plate will rise to 130 volts as indicated by the waveform at A in Figure 3B. At the same time the cathode condenser of tube No. 5 is discharged by the 22k resistor in parallel with it, and the voltage across No. 5 returns to 130 volts. The cathode condensers are made large enough to prevent this voltage drop from exceeding 70 volts until the tube is deionized, and does not fire again.

The action described has resulted in the transfer of conduction from tube No. 5 to the stop tube. If the same circuit was used between the stop tube and the next tube, a similar transfer of current from the stop tube to the start tube would occur with the next pulse applied to the starter anodes. In this manner, the current would be transferred from the start tube to tube No. 5, and so on down the line to tube No. 5 again, and the cycle just described would begin again. To summarize, each time a pulse is applied to the starter anode line the tube whose starter anode is returned to the cathode of a conducting tube will be fired and the conducting tube extinguished. This action will continue as long as pulses are applied to the starter anode line.

If this timing sequence were used, the stop pulse interval would be the same length as the selector pulse intervals, and improper operation of some printers would result. The extra resistor and condenser in the cathode of the stop tube are used to lengthen the stop pulse by the following method. As shown in C, Figure 3B, the voltage at the starter anode of the stop tube rose to plus 60 volts within a very short time after tube No. 5 started to conduct, and the combination of this voltage and the 20 volt pulse was sufficient to fire the tube. The voltage C1 which represents the starter anode signal for the start tube, is prevented from rising rapidly enough to permit the start tube to fire on the first pulse following the one which fires the stop tube. The one megohm rheostat and the 0.05 mfd. condenser cause the voltage to rise along on the curve as shown in the figure and the start tube fires on the second pulse following the one which fires the stop tube. This sets the stop interval at twice the normal interval or 44 ms. With this stop period the speed of the distributor is 337.5 operations of 56.25 words per minute. It should be possible to increase this speed by reducing the stop period to one and a half unit intervals by increasing the pulse rate during the stop interval.

A switch is provided to short the condenser at the junction of the rheostat and the 2.7 meg. starter anode return resistor of the start tube. The voltage at the starter anode is then held at ground level, and the start tube cannot fire. This provides a convenient start and stop switch for the distributor. If the switch is thrown at any point during the operation of sending a letter the counter continues to operate until the stop tube fires and the magnet is operated. At this time the counter ceases to operate, and the stop tube continues to conduct current until the switch is thrown to the start position. Thus, an operation is never interrupted in the middle of a letter, and no impulses are lost or letters garbled when starting and stopping the unit.

FIGURE 1—BASIC MECHANICAL DISTRIBUTOR



RELAY VOLTAGE WAVE FORM — LETTER "Y"
(CONTACTS 1, 3, 5 CLOSED)

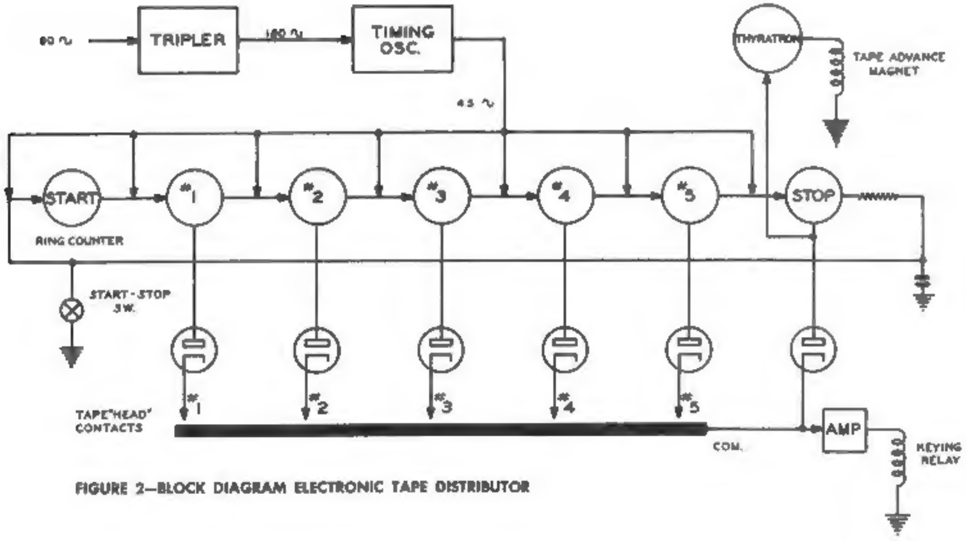


FIGURE 2—BLOCK DIAGRAM ELECTRONIC TAPE DISTRIBUTOR

Before continuing, it should be noted that the 727A tubes are not generally available, and were used here only because they were already on hand. The 1C21 or OA4-G are possible substitutes, although slight circuit modifications would probably be required. Hot cathode thyratrons such as the 6D4 or 884 will work very well, but would require additional circuit modifications. The reader is referred to the references listed at the end of the article for further information on the design and operation of gas tube counter circuits.

Figure 4A is a schematic diagram of the timing oscillator and Figure 4B shows typical waveforms. The synchronizing signals are developed by the 10 henry inductance and the 1 mfd and 0.1 mfd condensers in the grid circuit. They form a circuit between point A and ground which is series reasonant at 60 cycles and parallel reasonant at 180 cycles. A 60 cycle voltage is applied to this point through a rheostat and a non-linear resistor (thyrite). The current through the thyrite rises rapidly with increasing voltage, and when fed from a sine wave voltage this current is rich in third harmonic. Since the circuit shown represents a low impedance at 60 cycles and a high impedance at 180 cycles the voltage at point A is essentially a pure 180 cycle sine wave and is adjusted by the series rheostat to about thirty volts peak to peak. The rest of the circuit is a standard blocking oscillator frequency divider using a TV vertical blocking oscillator transformer. The output pulse is taken from a 1 k potentiometer in the cathode of the oscillator tube. Adjustment of the circuit will be described in connection with the description of the complete distributor.

The complete schematic diagram of the distributor is given in Figure 5. The operation of the various parts has already been discussed, but will be reviewed again. A 60 cycle signal from the power line is multiplied to 180 cycles by a frequency tripler circuit and used to synchonize a blocking oscillator running at 45 cycles. The 45 cycle pulses are used to operate a "ring of seven" counter circuit, and the cathode signal voltages of six of these tubes are used to operate the tape head in the same manner as a mechanical distributor would. The pulse from one of these tubes is lengthened to 44 ms and used for the stop signal. It is also used to trigger a thyratron which operates the tape advance magnet. The signal from the common contact of the tape head is applied to the grid of an amplifier tube with a keying relay in the plate. The contacts of this relay are connected to the terminal unit in the same manner as the keyboard contacts of a regular machine. A switch is provided to start and stop the counter. In the stop position the mark contacts of the keying relay are closed and my be connected in series with the machine contacts, so that no extra switching need be performed in changing from keyboard sending to tape sending.

Several points should be considered which were not discussed in connection with the description of the component circuits. In the first place, no description has been given of the keying relay circuit. In order to speed operation of the relay it has been placed in the plate circuit of the amplifier tube, which places the plate resistance of the tube in series with the relay inductance and speeds current build up and decay. The signal from the common contact of the tape head is applied to the grid through a resistor network which provides bias for the tube. In practice, the potentiometer in the grid is used to set the operating current to the required level. A 1400 ohm millisec relay was used in the original unit, and required an operating current of 10 ma. Other relays might require more or less current. The Sigma 4F relay should be entirely satisfactory in this circuit, and a coil resistance of 2500 ohms would be about right. The relay current is adjusted by measuring the voltage at the cathode of the amplifier tube (TP-2) when the start-stop switch is in the stop position, and adjusting R3 until the voltage equals the operating current desired, measured in ma. It is possible to reduce the bias encountered with slow relays by adjusting this control for best sending, but normally a current of about twice the minimum closing current will be satisfactory. The grid voltage drops below cutoff at the end of a keying signal, so the decay of current in the relay coil is very rapid.

In the diagram shown the keying relay contacts are connected in series with the keying relay contacts in the terminal unit, and since the relay is closed in the stop position, no additional switching is necessary. However, when the plate power is turned off the relay will open, so a switch is provided which shorts these contacts when the line switch is in the off position.

The timing oscillator adjustments are simple, but require the use of an oscilloscope. The first step is to apply the

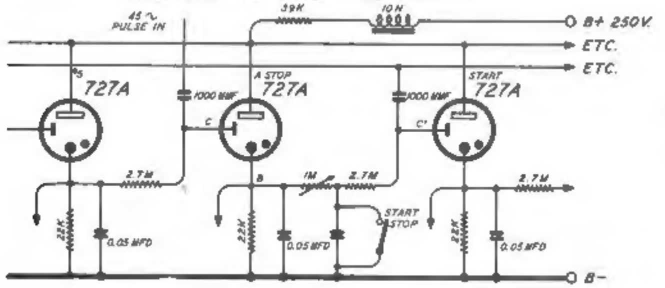
60 cycle signal to the tripler circuit with the B. O. tube out of its socket, and observe the voltage at TP-1. With the circuit constants shown it should be a reasonably good 180 cycle sine wave. In the original unit the inductor used was a small power supply filter choke, and the inductance was adjusted by varying the air gap on the choke until the best waveform was obtained. This coincides approximately with the maximum output voltage. The rheostat R1 should be adjusted then to produce about thirty volts peak to peak.

Replace the B. O. tube. Return to Figure 4B. The grid waveform of the blocking oscillator when adjusted correctly is shown in B. In order to observe this waveform without disturbing the circuit operation it would be necessary to use a high impedance input probe for the oscilloscope. This can be avoided by observing the voltage at TP-1 instead, as shown in A. Each time the blocking oscillator triggers it puts a small indentation in the signal, as shown. The grid resistor R2 is adjusted until these occur every fourth cycle. This completes the adjustment of the blocking oscillator. If the inductance used has a low Q the 180 cycle will have some 60 cycles present also, but this will not seriously affect the timing.

When the blocking oscillator adjustment is completed turn R4 so as to reduce the pulse voltage on the arm to zero and place the start-stop switch in the start position. Under these conditions the counter should not function, and one tube will remain conducting. Increase the pulse signal until the counter starts to operate, which is indicated by the motion of the glow from the cathode of one tube to the next in the line. When the counter is operating the glow will be seen to move rapidly from one cathode to the next, and the pulse amplitude is adjusted until this operation is uniform. The next adjustment is made on R5, the stop pulse length control. With the oscilloscope connected to the cathode of one of the other counter tubes observe the length of the cathode pulse. Then connect the scope to the cathode of the stop tube and adjust R5 until a pulse of double length is obtained. With the values shown this should occur in the middle of the range of the rheostat.

Throw the start-stop switch to stop, at which time the counter should stop operating, with the stop tube remaining in conduction. Then adjust R3 for proper relay current, as already described. As a final check of the counter operation connect the oscilloscope to the plate load resistor of the counter. A series of negaive pulses should be seen as soon as the start-stop switch is thrown to start. These correspond to the firing of each tube, and should appear in groups of seven, spaced 22 ms apart, with a gap of 44 ms and then another group of seven. If this is not observed, turn R5 back to zero resistance and readjust R4 until a regular spacing of 22 ms is observed between all the pulses. At this point readjust R5 for the double length stop pulse.

FIGURE 3 (A) Schematic Diagram, Ring Counter Unit



TUBE No. 5

Voltage	On	Off
A	130V	130V
B	60V	0V
C	115V	0V
C1	60V	0V

(Before Stop Fires)

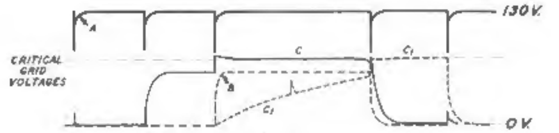


FIGURE 3 (B) Typical Waveforms

(B) TYPICAL WAVE FORMS

The tape head should now be connected, and the operation of the tape advance mechanism observed. With the circuit values shown no trouble should be encountered with this part of the circuit. It is necessary to use a paper condenser in the plate circuit of the thyratron. If trouble is experienced due to the thyratron not extinguishing each time it is triggered, try reducing the size of the grid coupling condenser and increasing the bias.

The distributor is now in operating condition and ready to send. As mentioned before, adjustment of the relay drive current while observing the sending may produce a better signal.

The circuit schematic includes a diagram of the power supply used in the original distributor. The power requirements are approximately 30 ma at 250 volts, one ampere at 6.3 volts and a half a milliampere at the bias voltage of -120 and -30. The power transformer used was 550 volts center tapped at 40 ma, and provided the correct operating current for the VR tubes without any series resistor. If a higher voltage power transformer is used the series resistor to the VR tubes should be adjusted for about 40 ma. total current. Under these circumstances it is advisable to add an 0.1 mfd bypass condenser between the +250 volt terminal and ground to keep the power supply impedance low at the blocking oscillator plate return point.

The VR tubes shown may be replaced by the somewhat cheaper VR-150 and VR-105. The neon lamps NE-2 may be replaced by any other 1/25 watt lamps without series resistors in the base.

No difficulties have been encountered in the operation of this distributor, and it has not been necessary to readjust any of the controls since they were originally set. However, the stop interval control R5 has also been used as a sending speed control, with interesting results. Some machines will print with a single unit stop period, corresponding to a speed of 64.3 wpm and this adjustment is made by reducing R5. Similarly, if desired, the stop interval may be lengthened beyond 44 ms to reduce the speed of sending. This has been suggested as a means for improving copy under poor signal conditions, but no experiments have been performed to date. Once the operator is familiar with the operation of the unit the adjustment of the speed control may be made by listening to the speed of the clicks from the tape advance magnet.

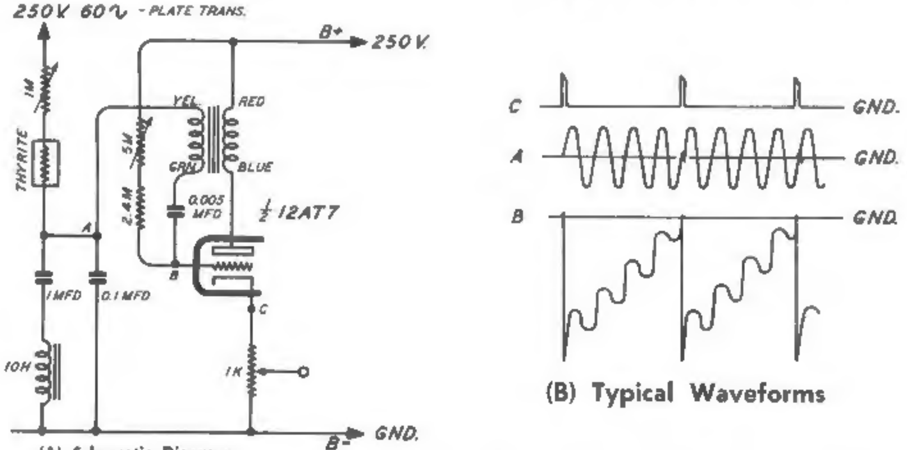
Complete circuit diagram is shown on pages eight and nine.

REFERENCES:

1 Keister, Ritchie, and Washburn, "Design of Switching Circuits," D. Van Nostrand Inc., New York, N. Y., 1951 pp 226-232, 264-267, and Fig. 11-21.

2 Chance, Hughes, MacNichol, Sayre, and Williams, "Waveforms," MIT Radiation Lab Series, McGraw-Hill, New York, N. Y. 1949. Chapters 16 and 17.

3 H. J. Reich, "Theory and Application of Electron Tubes," McGraw-Hill, New York, N. Y., 1944. (Second Edition) Section 12.32, pp 486-488.

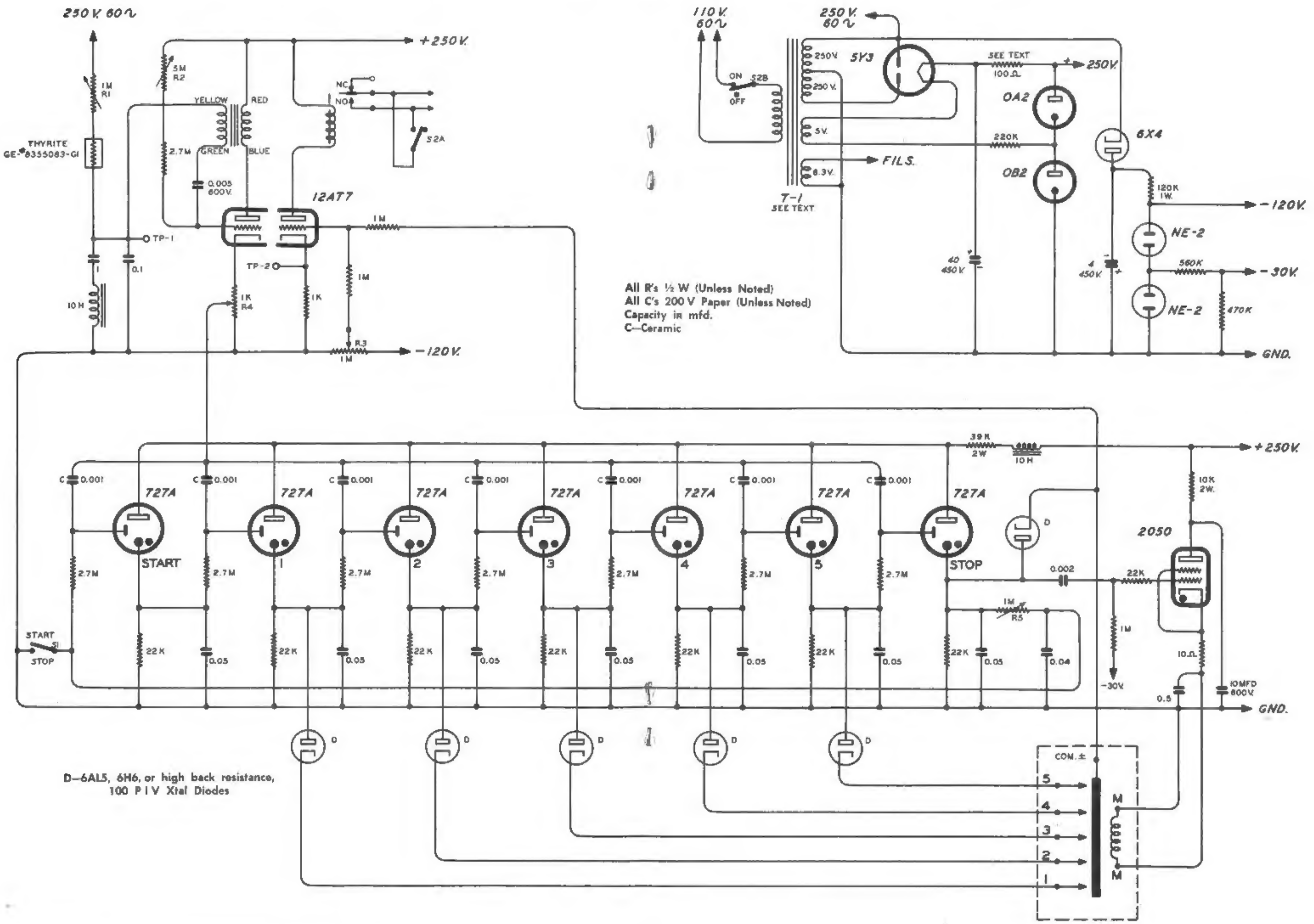


(A) Schematic Diagram

(B) Typical Waveforms

FIGURE 4—45 CYCLE BLOCKING OSCILLATOR DETAILS.

FIGURE 5—COMPLETE SCHEMATIC DIAGRAM, ELECTRONIC SENDING DISTRIBUTOR



All R's ½ W (Unless Noted)
All C's 200 V Paper (Unless Noted)
Capacity in mfd.
C—Ceramic

D—6AL5, 6H6, or high back resistance, 100 P I V Xtal Diodes

The Twin City RATS

On Monday, May 4th, a group of 11 of the Twin City gang interested in RTTY met at the home of Boyd "BeeP" Phelps, W0BP, Minneapolis.

Present were:

W0VER
W0HFU
W0CTW
W0KKP
W0FFW
W0UYJ
W0RWF
W0MGG
W0BP
Emil Wold (W. U.)
Ed Johnson (Minn. Mining)

Four others were out of town, sick or working.

The meeting was informal with BP acting as **Quick Brown Fox,** the position of **Lazy Dog** was unfilled, and HFU was appointed RY to get out future meeting notices. Simple receiving and FSK units were shown and discussed as well as individual problems and general gab. It was decided to hold meetings on the first Monday of every month at the home of W0BP and an invitation is extended to all interested persons.

Projection slides have been offered by W6NRM/W9TCJ, as well as at least two inspection trips to nearby commercial installations. The meeting adjourned to the ham shack and lab of BP where printing from magnetic tape was demonstrated, followed by refreshments of varying viscosity.

Hints on Vacuum Tube Keyer

When using a vacuum tube keyer to operate the receiving selectors of a Model 12 Teletype, erratic operation may result due to uneven spring tension of the selector latch springs.

A simple way to test is to apply about 22½ volts from a heavy-duty B battery, one side to the common terminal on the selector assembly, and then touch the other battery terminal to terminals 1, 2, 3, 4 and 5 in turn. If each selector trips, the operation is satisfactory. If any latch does not trip, and is not binding, and assuming the armatures have proper clearance and travel, then the latch springs are probably too stiff. The assembly should be taken apart, and each spring given the same tension. If any springs are too stiff, a third to a half turn may be clipped off to weaken them. Weak springs may be stretched to stiffen.

—W. G. Ludgate, W7LU

Armed Forces Day Message

RYRYRYRY RYRYRYRY NDW NDW
RYRYRYRY RYRYRYRY NDW NDW

RYRYRYRYRYRYRY NDW NDW BT

It is essential to the National Defense that Radioteletype Circuits achieve a degree of reliability at least equal to that of Radiotelegraph X An important factor in achieving this reliability is a source of personnel who are familiar with the techniques and equipments used in Radioteletype Communication X Within the last few years there has been a growing interest in Radioteletype for Amateur Radio Communication X The individual amateur has proved that the skill and knowledge gained from the pursuit of his hobby stand him in good stead in both industry and in Military Service X While the number of amateurs who are able to copy this message is comparatively small comma the recent action of the Federal Communications Commission comma in opening additional amateur bands to frequency shift keyed transmission comma has provided a new opportunity for amateur activity X We are confident that radio amateurs will meet this opportunity with their usual enthusiasm comma energy comma and ingenuity X George I Back Major General USA Chief Signal Officer W B Ammon Rear Admiral USN Director Naval Communications Gordon A Blake Brigadier General USAF Director of Communications BT AR

75% of the SCRTS copied this Armed Forces Day message.

A NOTE ON THE W6NRM-W9TCJ AFSK CONVERTER RTTY, APRIL, 1053

A small item was left out of the circuit diagram of the AFSK Converter. A mica capacitor of .005 mfd should be connected between the midpoint connection of the two 20K resistors (6H6 Diode Load Resistors) and ground. This is the point where the two secondaries of the Mark and Space Audio Transformers are connected together. Also to the mid-point between the 220K resistors. The effect of this addition is to give crisp indication to Magic Eyes or Oscilloscope Tuning Indicator, yet, does not distort the output waveform of the D-C Teletype signal output.

—W9TCJ

Make and Break RTTY -- a Challenge

BY FORREST BARTLETT—W6OWP

Briefly, the approach here has been to develop a fixed signal-to-noise ratio by means of limiter-filter action and then "detect" the signal portion of the resultant output to use as the driving voltage for a positive on-off keyer connected in series with the printer signaling loop.

Except for the "Clamp" action of the FSK marking frequency, the system closely parallels the ratio type converter used for F-1. Need for the Clamper is obviated, to a large degree, by high selectivity ahead of the first limiter, enabling it to function chiefly on one frequency with noise and other components sufficiently attenuated to preclude blocking when the desired signal is present.

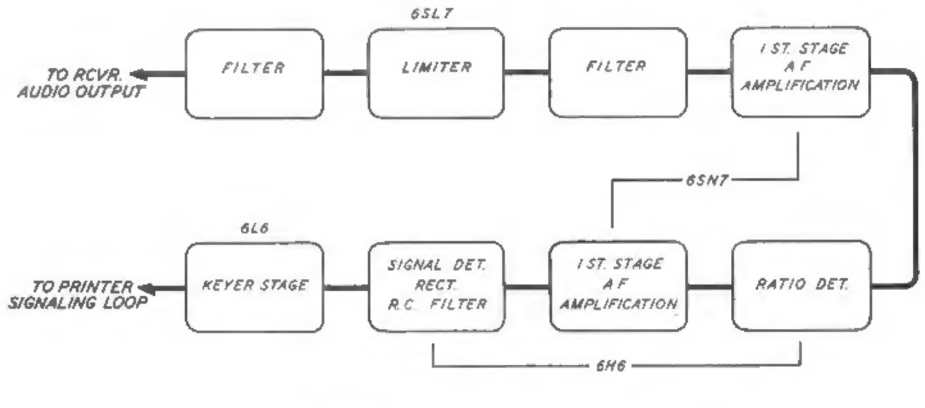
A block diagram is shown. The actual converter is less complicated than the diagram might imply.

The two filters are FL-5 surplus Range units, unaltered. They are both connected to pass 1020 cycles—"range" hook-up. The first limiter restricts converter input to 1020 cycles, plus noise and attenuated QRM. In the limiter stage this conglomeration is built up to the same output level. The second filter establishes the ratio of signal-to-noise amplitude. An amplifier brings the level up for the detection process. The detector is merely a biased diode which passes the signal but rejects the noise. The output of this diode is again amplified and then rectified in a second diode. The resultant DC voltage is used to cut off the grid of the 6L6 keyer tube. An RC filter is used in the signal rectifier to knock out "shot" type interference which may pass through the ratio detector.

With no signal, there is no bias applied to the 6L6 and mark current flows through the printer loop. Thus, operation of the converter is on the spacing funtion. To reverse the operation for "mark" signals requires either the addition of a relay, or a secondary bias supply for the keyer tube in conjunction with a reverse hookup of the signal rectifier. I shall probably incorporate the latter arrangement when I "Finalize" the converter circuit for construction of a permanent unit.

But at this writing, the outline above comprises the M. A. B. circuit now in use. In addition to the mark-space reversal, there are other improvements that could be worked on the present haywire version. For one thing, the required audio input is too great. By efficient use of voltage step-up transformers in place of resistance coupling and by properly matching the FL-5's I believe I can lick this problem.

There's no particular reason for using 1020 cps except that suitable filters in the form of the FL-5 or FL-8 are cheap and easy to obtain.


6SL7
TO RCVR. AUDIO OUTPUT
FILTER
LIMITER
FILTER
1 ST. STAGE A F AMPLIFICATION
6SN7
6L6
TO PRINTER SIGNALING LOOP
KEYER STAGE
SIGNAL DET. RECT. R.C. FILTER
1 ST. STAGE A F AMPLIFICATION
RATIO DET.
6H6

BLOCK DIAGRAM W6OWP M.A.B. RTTY CONVERTER

Traffic Net News

EMILE DUVAL, W6FLW

The Southern California Radio Teletype Society Net operates every Tuesday evening at 7:30 p. m. on 147.85 mc.

BULLETIN—Attention all members of the Tuesday Evening Net:

By a vote of the SCRTS members present at the meeting of May 23, 1953, the Tuesday Evening Net Roll Call will begin at 7:30 p. m., effective June 2.

A second Roll Call will be held at approximately 8:00 p. m. and all late stations are requested to wait until then before calling in.

Net Activities Committee,

Net Control Stations Appointed for the Month of June, 1953.

June 2—W6EZJ (W6IZJ Acting)
June 9—W6GFI
June 16—W6IZJ
June 23—W6KNI
June 30—W6NAT

Net Committee requests that stations have a preamble comparable to the one listed below which was used by W6CLW on May 12, 1953. A tape will be furnished to those who have tape transmitting equipment and others should ask one of these stations to run the tape for him on his night as Net Control.

1) First order of business is call of station according to the following procedure:

W6AAA de RTNET W6XXX (Net Control)
RTNET de W6AAA (no) tfc (Ans. Station)
W6AAA de RTNET QRK (5) (Net Control)
(0—No Signal)
(1—Detectable Signal)
(5—Perfect Copy)

Stations will be called from alphabetical list of recently active stations. Following the list cal RTNET will call QRU? for uncalled or late stations.

2) Second order of business will be dispatch of traffic by reporting stations. All transmissions of traffic will be under the direction of RTNET Control Station.

3) Third order of business will be entertainment of requests by net stations for miscellaneous communications. Such requests should be short and no communications will be transmitted without clearance of RTNET Control Station.

4) Fourth order of business will be retransmission of RTNET announcements and QRU? for any stations not previously checked in.

5) Last order of business will be transmission of net communications under the direction of RTNET Control Station. No station will engage in any independent communication with another net station

Activities for the Month of May are as follows:

May 5—W6CL, N. C.—12 Checkins.

W6AEE
W6CL
W6DEO
W6EV
W6FLW
W6KNI
W6NAT
W6NWM
W6PNW
W6RL
W6SCQ
W6IZJ

May 12—W6CLW, N. C.—16 Checkins.

W6AEE
W6CL
W6CLW
W6DEO
W6GFI
W6EZP
W6EV
W6NAT
W6NWM
W6RL
W6SCQ
W6WYH
W6FLW
W6IZJ
W6KNI checking in via W6EV
W9TCJ checking in via W6AEE (40 meters)

May 19—W6AEE, N. C.—12 Checkins.

W6AEE
W6CL
W6CLW
W6EV
W6FLW
W6IIV
W6NWM
W6RL
W6SCQ
W6KNI
W6NAT
W6IZJ

May 26—W6EV, N. C.—13 Checkins.

W6AEE
W6CL
W6CLW
W6CMQ
W6FLW
W6IZJ
W6KNI
W6NAT
W6NWM
W6SCQ
W6WYH
W6EV
W6MSG—Paso Robles, 40 meters

Emile Duval is out of town for about a month and will make next month's appointments when he gets back.

RTTY is the Official Publication of the
Southern California Radio Teletype Society
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For Informateion regarding the SCRTS contact the following:
W6CLW—Ed Simmons
W6AEE—Merrill Swan
W6SCQ—Lewis Rogerson

For Traffic Net Information:
W6FLW W6IZJ

For "RTTY" Information:
W6CL W6CLW
W6DEO W6AEE

Comments from Readers

"My QST arrived today and I noted the column or so of comments re RTTY frequencies. Unquestionably, 7140 is the best frequency on forty in this area. It's easier to sandwich in between foreign phones than it is to continuously dodge the very frequent CW QRM on 7070 and 7090. On eigthy, 3620 has been out from the beginning here because of active traffic net circuits. I have made some late evening efforts on this band but have given it up for the time being. On twenty, I have no basis for comments since I have yet to hear an amateur RTTY station there."

—W6OWP

"Received the April issue, congratulations on the excellent work. Its a valuable source of information to all our RTTY friends. Can you tell me the names of any West Coast hams who have been able to set a 32-V series Collins transmitter up for FSK (without wrecking it?)"

—W1TWP

"Am looking forward to the May issue and that electronic distributor article."

—Lou Buck

"It was sure nice to QSO with you via W3PYW the other evening. Would like to try again when you are also relaying a 2 meter station. I don't expect to be on 40 or 80 myself until fall because I must spend all my available hamming time sudying for the D. C. Bar examination. Hope to practice Patent Law sometime this year if successful in the tests."

—W3RHX

"Here's hoping you fellows keep within your 850 cycles shift and have no bad RY tapes or reversed signals."

—KL7ADD

"I've just started terminal equipment . . . Model 12 ordered first of April and not here yet. Have 500 watts on all but 15 meters."

—WØNME

"I have prepared a short notice on the 'SCRTS' and 'RTTY' for insertion in our magazine. Thanks for mentioning us in your latest issue."

—73. W1NOA, Radio & Televison News

Haven't been active for several months due to lack of any time, but hope to get back on shortly, if all goes well."

—73, Ken, W7IHI

"I like the 'RTTY' April No. 4. If possible, please send me the back issues. Let me know the charges. The equipment here is a 14 printer and a No. 12 for transmitting. Just getting on the air. Hope to hook up with some of the boys on the air. Am mostly on 3620 now."

—Ray, W9GRW

"Here's my check for your very fine RTTY magazine. I enjoyed it very much. not too active RTTY wise as of the moment. Get started on another project and dropped RTTY for the moment. Sure get the urge tho' when I hear the FSK and some of these days I'm going to get reinstalled. Have all the equipment both commercial and choke made filters and all I need to do is to hook it up. So-o-o-o it shouldn't be too long."

—73, Andy, W3NL

"I have checked with the Local Telephone Co. and one of the boys there is trying to see what he can find out about old and obsolete equipment. Western Union here doesn't know what happens to their old gear. So if you can tell me by what means you fellows have acquired Model 12 and 15, etc., I would appreciate it very much. I have enjoyed your magazine very much. Keep 'em coming."

—Frank, W4KFK

"Thanks for sending me your bulletin in response to my inquiry some time ago. I find it very helpful and am keeping them on file until I can get set up. As it is now, all I have is an old VFX-680 in need of something or other. I will be outside for a year or so going to school, I hope. Maybe I can pick up a piece of equipment or two if finances permit."

—KL7AKD

"RTTY is terrific! Your coverage in the Model 12 is terrific! Keep up the good work. I am quite excited about the statement in the No. 4 issue that an electronic distributor diagram yould appear in the next issue. A friend and myself have been working on one for quite a while but guess you beat us to it. When it is completed I will send you specifications and diagrams. I'll have to sign off now as I have to shovel snow (April 27) off the side walk. Don't laugh! We had about three inches of very cold snow not more than two weeks ago."

—Stanley Fierston

"I find this magazine very interesting and a MUST for any amateur who is interested in Teletype.

—VE2ANM

"Hope to hook up with your gang often on FSK bands. Presently only active on two meters AFSK."

—73, W2AKE

"Greetings from the East Coast. Had quite a bunch of VHF Teletypes around here for a while but with lack of interest in some, and shift to low frequencies by others things are a little slack at present."

—W3PKF

"Keep 'em printing" —Pete, W2TLY

"I am not on the air at present as I expect to be on the West Coast for three or four months, and before I left Chicago, I turned my complete equipment including printer over to another ham. I expect to be in Pasadena sometime the latter part of the summertime and would enjoy having the opportunity to meet you and the rest of the RTTY gang."

—George, W9FJO

"Have the works in TT (Model 12 and tape gear but not on yet). W6JZ also has it all and is on. W6ITH and W6DOU about wind up the Bay Area TT gang that I know of."

—Fred, W6HFK

How about W6OWP and W6RZL who are active? Ed.

"Is it possible to purchase back issues of 'RTTY?' Please quote price on all back issues that are available and hold.

—W2SDE

RTTY still has back issues. Ed.

"Have been trying to gather all the info I can because I do not have too much on hand and no one near by with whom I can discuss my problems."

—W3LCH

"Just came up from the basement where the first holes were made in what is to be my first converter."

—Ray, W8KFA

"I have a 21-A and a 12 receiving distributor for sale. Also a Model 25 BRAND NEW, its a different version of the 21-A."

—W2EHW

"I have enjoyed the last two issues of RTTY very much and wish to congratulate you and your associates on the effort you must put forward to make it possible. Please enter my subscription and the following three . . . . "

—W8DLT

REGULAR MEETING OF THE SCRTS

The regular meeting of the Southern California Radio Teletype Society was held at Shorty Griggs, W6RL in El Segundo, California on Saturday, May 23, 1953, with Shorty and Jim Childress acting as Hosts.

The meeting got off to a late start because of the great distance some of the members had to come, but a lot of business and discussion was crowded into the evening.

Ed Simmons, W6CLW again acted as General Chairman, while Lewis Rogerson took on the job of Secretary and Treasurer. Emile Duval took over the Net Activities to start the evening off. By popular vote the time of starting Net Roll Call has been advanced to 7.30 instead of 8:00 o'clock starting with the June 2nd Net Gathering.

A discussion was held on low frequency operation and comments and ideas were exchanged by the different members. This discussion took place partly in the dark as Shorty had a slight overload on the light circuit which kept the circuit breaker and some of the members busy bringing back the lights.

Ed Phillips, W6IZJ, gave a talk and displayed his Electronic Transmitting Distributor running some tape through a 1-A tape transmitter. The thing is a little beauty and works like a charm. It is described in this issue of the bulletin.

After the meeting was adjourned Jim Childress fired up the barbecue gadget and served some mighty fine hamburgers along with plenty of refreshment. The gang voted the feast as one of the best they had ever tasted. Thanks Shorty and Jim—a swell job.

There were 32 present at the meeting consisting of the following:

W6AEE
W6ICS
W6IZJ
W6CL
W6DRL
W6KNI
W6EV
W6CNM
Art Addaway
Jim Childress
W6WYH
W6ILW
W6FGS
W6CMQ
W6IIV
W6BWQ
W6FLW
W6MYC
W6CAP
W6NSS
W6NYF
W6BAE
W6ZBV
W6CYR
W6FNW
W6GFI
W6CLW
W6RL
W6SCQ
W6EKO
Miss Ann Cheaney (YL of Jim Childress)
Mrs. Hannah (XYL of W6BAE)

TAPE OFF THE FLOOR

. . . . So my best to the gang from W1AW, Hartford. CU on often as time here permits. Guess it goes to Marv now. W2PAT de W1AW.

* * * *

. . . . We should really shift into high or overdrive now that W1AW is with us. W9TCJ de W3PYW.

* * * *

The neatest trick in electronics we have seen in a long time is Ed Phillip's (W6IZJ) Electronic Distributor.

* * * *

. . . . W1AW, W1BGW and W3PYW de W2PAT. (80 meters).

* * * *

. . . . Merrill I sure enjoyed your last bulletin, sent you a nice letter. Can't stay long. W6AEE, W9TCJ de W3PYW.

* * * *

We are sorry to hear that Shorty, W6RL broke a couple of ribs after the meeting at his place in May. Shorty is up and around again but will probably have to take it easy for a while.

* * * *

. . . . W6OWP de W6GJU at Los Angeles. National Guard Station A F S Day.

* * * *

. . . . I have been very busy with Waco Disaster traffic lately and haven't been on as much as usual de W5QDD.

K6AC, Rudy purchased a Model 12 from W6EV and had plans for getting on the air immediately but providence stepped in and put Rudy to work, so now we have to wait until Rudy get some spare time to fix up his terminal unit.

* * * *

. . . . W6AEE de K6EV, Santa Barbara transmitting M A B using standard equipment. (Make and Break, Ed).

* * * *

. . . . Bob was thru Portland last summer and visited Temple W7VS and myself. We had a great time talking back and forth here in the shack via buzzer and key . . . . de W7LU Portland.

* * * *

W6CAP Bob has put up a very beautiful 60 ft. telephone pole and is in the process of accumulating a coaxial job. We should hear Bob on two meters soon.

* * * *

. . . . Am on Auto Start now so will be set up on 7140. So how we doing. This is W0UVL located in Pierre, So. Dakota.

* * * *

. . . . Say Phil, I read your fine article in latest issue of RTTY about the FSK exciter for your Collins ART-13. It looks very good. W2JAU de W9TCJ.

* * * *

If W6ILW can get the bugs out of his terminal unit he will be on two meters very shorty. It seems as tho the secondary of the tone oscillator transformer is shorted and if a new one can be located everything will be honky dory.

* * * *

. . . . W6CYR de W6CMQ. Do you copy Jim? The net is looking for you. ga.

* * * *

Jim Perkins, W6CYR has been heard in the Los Angeles area on two meters this past week. Well that is news as we have been waiting for Jim to finish his yard work so he could get back on.

P. S. Jim is in Santa Ana.

* * * *

"Will try to make the net after I rebuild the terminal unit.

—Bob, W6JAU